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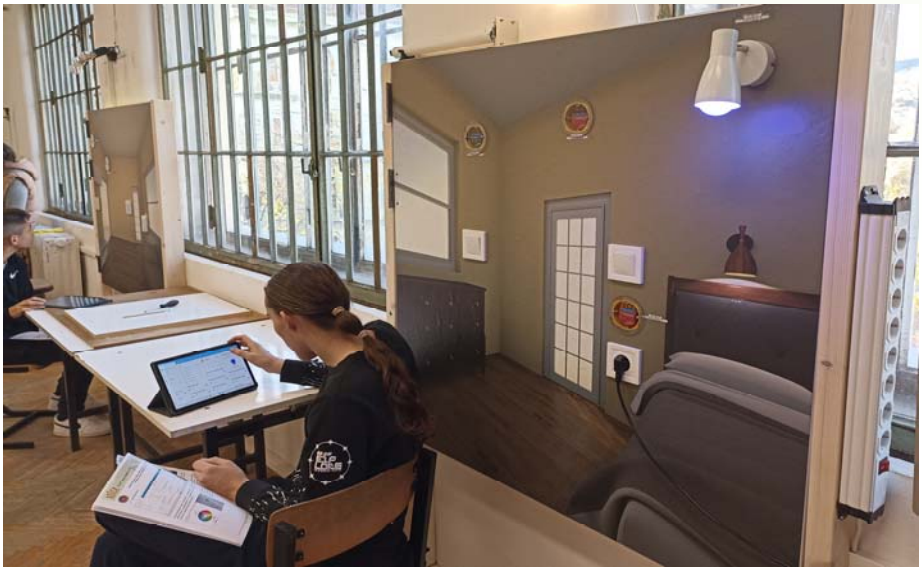
Smart Home Models in VET Newsletter

Dissemination of Project Results

In the second project year dominating activities are webinars, open days, workshops and smart home club programmes. They promote our smart home models and OERs. One of them is the Glossary of terminology typical of the smart home technology. In this issue, you can find a selection of terms from the Glossary that will bring you closer to the topic of the project. The photo below was taken in the BMSC Zipernowsky Károly Technical School from Pécs during the open day held on 15 December 2023, when visitors used the smart club booklet and managed smart home model boards.



Co-funded by the European Union

From the Content

Smart Home Glossary

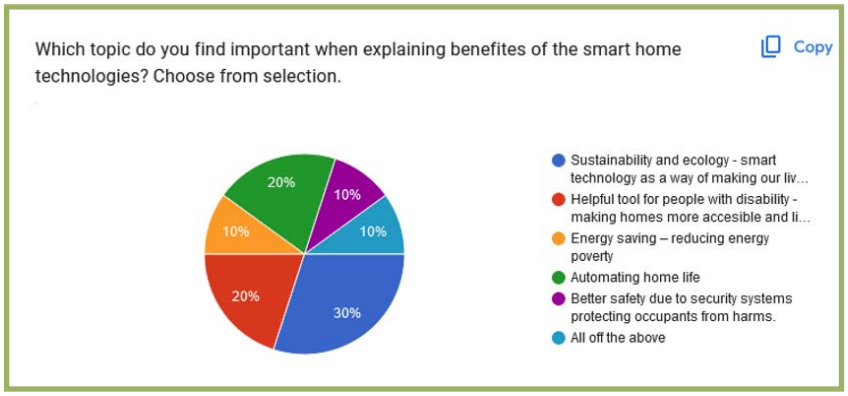
Actuator — A device that performs a task when triggered manually or by a sensor when certain conditions are met.

Artificial intelligence — The ability of a computer system or robot to perform tasks traditionally carried out by humans that require human intelligence. In smart homes AI allows for the learning of a homeowner's behaviour to meet the homeowner's needs.

Bridge — An electronic device that creates a single network from multiple communication networks or network segments.

Survey on Smart Home Technology Benefits

Students and staff of the partner schools have been asked to take part in an online survey that should tell authors of the animated film titled "Home Smart Home" from ELPROS what the participants think about the future film content and possible benefits of the technology. Four topics have been offered as important and an option to add another at one's choice. Voting results in percentages are presented in the graph taken from the survey statistics.



The short study programme titled "Smart Environments" created in VTSNS has been approved by the National Council for Higher Education of Serbia. The programme is one of the major results of the Smart Home Models in VET project.

Smart Home Glossary

Broadband — A high speed internet connection supplied by an internet Service Provider (ISP).

Bus cable — A system element used for wiring elements of the same type to a smart home system and connecting them into a single control-monitoring system.

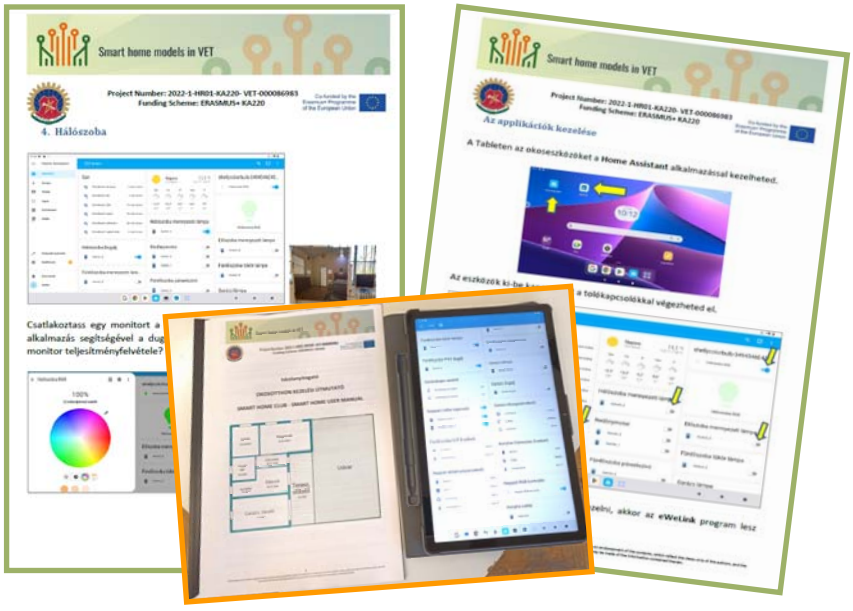
Embedded system — A combination of computer hardware and software designed for a specific function of a device.

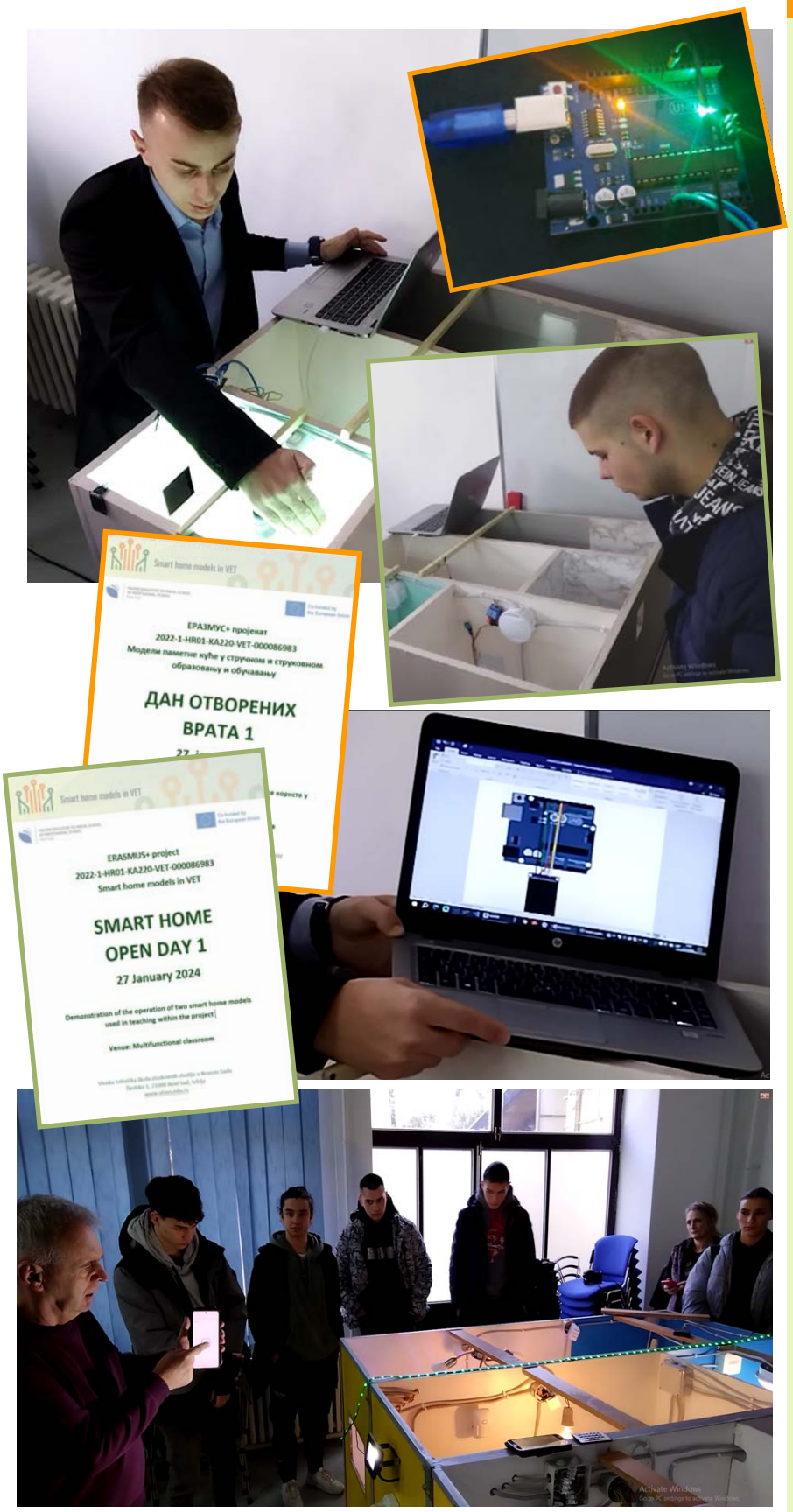
Gateway — A piece of networking hardware with built-in software that connects two networks with different transmission protocols together. It interprets and transfers data from one system to another.

Microcontroller — A small computer on a single integrated circuit designed to govern a specific operation in an embedded system.

Smart Home Club Workbook

The project team from BMSC have prepared a 10-page booklet for those students attending the extracurricular activity Smart Home Club, but it is also used at other occasions like during the event "DigiZipi" organised for regular students on 04-11 December 2023 to give them an insight into the opportunities of the digital world, or on open days aimed at primary school children. So, a larger number of young people practiced with the publication and a tablet in the smart home classroom equipped with models of different rooms. They remotely controlled electrical consumers and measured basic electrical quantities referring to the smart boards of the educational panels. Smart devices of this smart home model are all connected to the Home Assistant server.





Above: Photos from the first open day held in VTSNS on 27 January 2024 where two smart home models were presented to pupils intending to enrol in the school

Smart Home Glossary

Home automation — Integration of different electronic systems and devices controlled from a central hub so that they can be used with minimal human interaction for various tasks around a home such as locking doors, setting alarms and turning on and off lights.

Integrator — Also known as a system integrator, is a person or company specialized in building a smart home system, connecting smart devices, building the wiring, enabling connections, configuring the system, etc.

Internet of Things — The network of electronic devices and home appliances that communicate and exchange data over the Internet, and can be remotely monitored and controlled.

Navigator— A device used to control other smart home devices. It is usually a touch panel, remote control, dashboard, or a menu screen on a TV.

Network — In home automation, it is two or more connected devices communicating with each other using wired or wireless technologies.

Node — A specific point/device in the home automation network with its own unique address, which gets identified by the network controller for the purpose of getting control over it.

Pairing — Connecting a device to another device to control it through a wireless protocol like Bluetooth.

Protocol — A set of rules/underlying mechanism that allows the communication between certain integrated devices. The most common smart home protocols include Bluetooth, Wi-Fi, Z-Wave, Internet protocol (IP) and Zig-Bee.

Relay — A wired or wireless-controlled device that controls the on/off state of an electrical circuit.

Smart Home Glossary

Router — A physical or virtual appliance that connects networks and use IP addresses to forward data.

Scene — A defined state of certain devices that is controlled with one command. For example, a scene can specify that light A should be turned on and light B should be bright red.

Sensor — An electronic device that can detect changes in its environment. Sensors monitor specific parameters such as motion, temperature, air humidity, soil moisture, light, solar UV radiation, pressure, gas leak, water leak, smoke, air quality, etc.
Sensors usually work in tandem with actuators, which send a signal to other devices or systems to react if necessary.

Smart sensor — A smart or intelligent sensor is a combination of sensor and microprocessor in one unit. It detects changes in the physical environment but also uses its built-in compute resources to perform predefined functions such as to collect and process data before passing it on.

Smart device— Compared to traditional devices, they can perform functions dictated by algorithms.

Smart home— A home with multiple smart devices interconnected with each other and controlled by a home network allowing for full home automation.

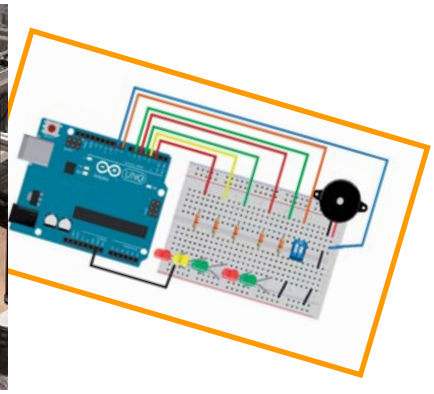
Smart home hub — A control centre for a smart home that monitors it by communicating and controlling its different components, smart devices, and enables them to communicate and respond to each other. The smart home hub usually consists of a dedicated computer and software.

Switch — A device that can make or break a connection in an electric circuit. It can work via a wireless connection.

Smart Home Club Workshop in ELPROS

Programming sensors and actuators using Arduino was the assignment for a group of ELPROS pupils attending a Smart Home Club Workshop in the premises of their school in December 2023.

They were asked to perform several tasks: to program sensors and control opening and closing of the door, to measure temperature in the room, to detect a fire at different distances and to create an advanced traffic lights. The club members worked in pairs helped by their teacher.



Setting up clubs like this one for secondary VET pupils in partner schools is part of Work Package 3 of the project. This is a less formal way for pupils to learn more about smart techno-ogies and programming.

The learning material produced for clubs can be exchanged between project partners. It is also available as an open educational resource to other interested schools and individuals on the website address of our Erasmus+ KA220-VET project Smart Home Models in VET.

Details of the Smart Home Club activities in Osijek, Croatia

Toolkit for Creating Smart Home Models

Activity 2.4 from Work Package 2 titled Smart Home Model Development is about creating a useful tool for those planning to make a smart home model of their own. Based on the experience gained in model making in IVVEC and on the exchange of good practices with partners in this project, our colleagues Marina Hämäläinen and Konstantin Malinovski have prepared a publication that will be a valuable resource for VET teachers and students alike.

In the Toolkit one can find instructions and explanations that will guide them through the process of model development. Part 1 is about understanding smart homes and types of smart home models. Part 2 is devoted to the process of creation, which consists of several steps — gathering of adequate materials, assembling of

the model, and then wiring and connectivity. Part 3 is focused on testing and troubleshooting. Part 4 gives tips to the user what should or should not be done while making the model. Finally, in Part 5 there is a set of frequently asked questions with answers.

Smart Home Glossary

Thing — A thing, in the context of the Internet of Things, refers to any entity or physical object such as a device that connects to a network and can communicate with other devices over the network.

Trigger — A set of values or conditions of a platform that are defined to cause an automation to run.

User interface — The medium that enables user to interact with the smart home system. The communication can be text-based, spoken or through visual elements (icons, buttons, scroll bars, etc.).

This project is about making educational smart home models for VET students and introducing smart home technology in the curriculum and clubs.

Frequently Asked Questions

What types of smart home models can I create?

The types of smart home models you can create depend on your specific needs, preferences, and the devices you choose to integrate. Here are several common types of smart home models, each focusing on different aspects of home automation: Hub-Based Model, Cloud-Based Model, Decentralized Model, Integrated Model, DIY Model, Voice-Controlled Model, Sustainable Living Model. When creating a smart home model, consider the compatibility of devices and platforms, the level of automation you desire, and the specific goals you want to achieve in terms of energy efficiency, security, convenience, and overall lifestyle enhancement.

Can I integrate different brands and types of smart devices in a single model?

Yes, you can integrate different brands and types of smart devices in a single smart home model. Many smart home platforms and ecosystems are designed to be interoperable, allowing devices from various manufacturers to work together seamlessly. By carefully selecting compatible devices and using a versatile smart home platform, you can create a unified and cohesive smart home model with devices from different brands and types. Keep in mind that while interoperability is improving, it is always a good idea to research and verify compatibility before making a purchase.

What are the essential components for a smart home model?

Building a smart home model involves integrating various components to create an interconnected and automated system. The essential components for a smart home model include: hub or controller, smart devices, such as smart lighting, smart thermostats, smart locks, smart cameras, smart sensors, smart appliances, voice assistants, network connectivity, mobile apps, automation platforms, security features, energy management devices, smart blinds and curtains, etc.

The photo above shows the PMC model in construction

Smart Home Glossary

Voice assistant — The software installed in a smart device that allows the user to control smart devices with voice commands. Examples include: Google Assistant, Apple Siri and Amazon Alexa.

Wake word — A defined word pronounced by a user to put a voice-controlled device in listening mode and ready for work.

Wi-Fi — A wireless protocol (language) for connecting multiple devices using radio frequency to provide network connections.

Wireless network — A group of electronic devices linked together, which communicate through radio waves using the same radio frequency.

X10 — The oldest smart home protocol, used for carrying control signals wirelessly or over the electrical wiring in a home, first introduced in 1975.

Zone — An area in a building or room where a set of several specified events can take place.

Smart Home Glossary

ZigBee — A communication protocol using radio frequency to provide control of ZigBee devices from a wireless network in a smart home. It has excellent range, low-energy usage, and fast speed; however, ZigBee compatibility between different manufacturers' products is limited.

Z-Wave — A wireless protocol for home automation that allows you to control Z-Wave compatible devices from a central source. Each device using this protocol acts as a signal booster for each other device in the relay, which extends the network range.

Smart Readiness Indicator

In 2018, the EU established the Smart Readiness Indicator (SRI) to rate the capability of buildings (or building units) to improve their operation, optimize energy efficiency and overall performance.

The SRI should raise awareness of the value behind building automation and electronic monitoring of technical building systems and point out the actual savings resulting from the enhanced functionalities.

On Our Next Meetings

The spring meeting scheduled for this year is hybrid and it has been agreed to be held on 18-20 March in two locations — on the premises of the Panavėžio Mokimo Centras, Lithuania, and Visoka tehnička škola strukovnih studija u Novom Sadu, Serbia. The Estonian team from Ida-Virumaa Kutsehariduskeskus is visiting Panevėžys, while colleagues from Baranya Megyei Szakképzési Centrum Zipernowsky Károly Műszaki Technikum, Hungary, and Elektrotehnička i prometna škola Osijek, Croatia, are coming to Novi Sad.

The meeting agenda will cover topics related to activities in progress such as Budget reporting from Work Package 1, then Course piloting, and Final preparation for course delivery from Work Package 3, Evaluation of instruction materials dealt with in Work Package 4, as well as the dissemination activities from Work Package 5.

This meeting is also a chance for the teams to discuss other forms of cooperation and possible new project ideas.

The final project meeting set to the last project month was supposed to be in-person and held in Sillamae, Estonia. However, the partners later agreed to change its form and hold it as an online session. The decision has been approved by the Croatian National Agency AMPEUS.

PANEVĖŽIO MOKYMO CENTRAS

IDA-VIRUMAA KUTSEHARIDUSKESKUS

ВИСОКА ТЕХНИЧКА ШКОЛА СТРУКОВНИХ СТУДИЈА у Новом Саду

Baranya Megyei Szakképzési Centrum

ELPROS REGIONALNI CENTAR KOMPETENTNOSTI

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To learn more about the project, visit its website at:

https://smarthomemodels.eu/

Smart home models in VET

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